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(54) **FASTENER FOR FASTENING A SPARE WHEEL CRADLE TO AN UNDERBODY**

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(52) **U.S. Cl.**
CPC ***B62D 43/04*** (2013.01)

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CPC B62D 43/04
USPC 224/42.12, 42.23
See application file for complete search history.

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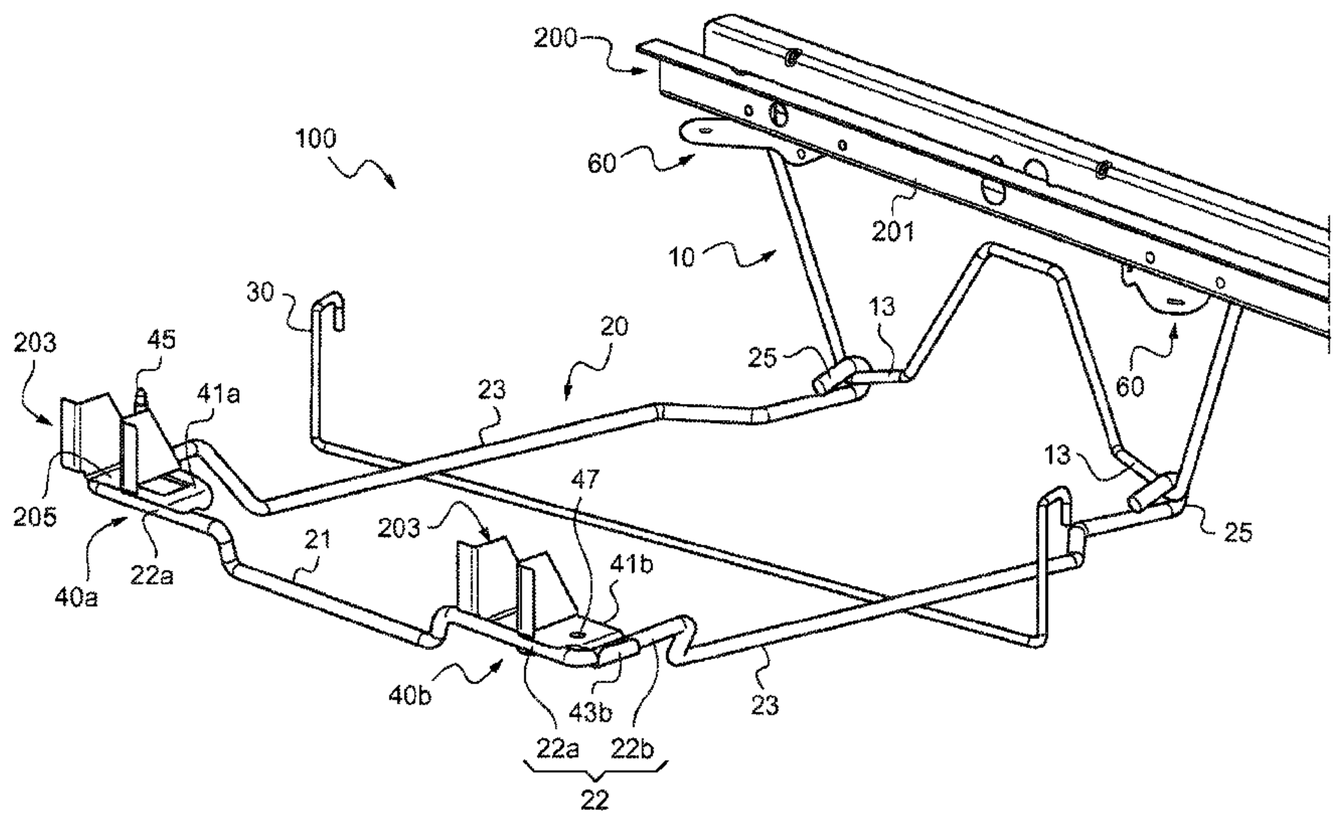
(57) **ABSTRACT**

An assembly for holding a spare wheel of a motor vehicle includes a cradle, a cradle support, and a holding member. The cradle accommodates a spare wheel and is mounted pivotably between a closed position and an open position. The cradle support includes a link area fixed to the underside of the vehicle and a part forming a pivot for the cradle. The holding member of the cradle support or of the cradle includes an adjustment portion extending under the link area of the cradle support or of the cradle when the motor vehicle is in the driving position.

16 Claims, 4 Drawing Sheets



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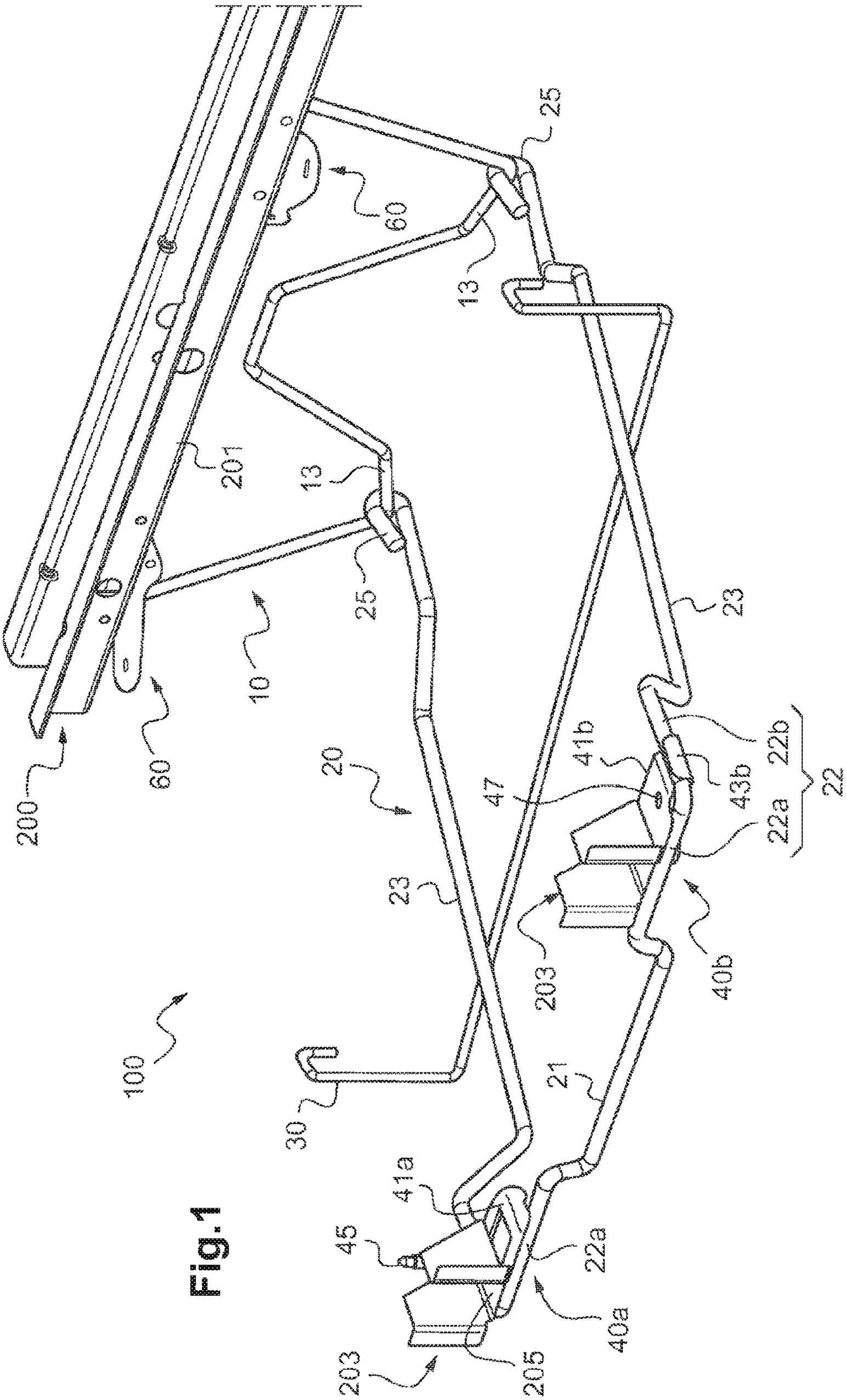
100
200
201
203
205
10
20
21
22
22a
22b
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25
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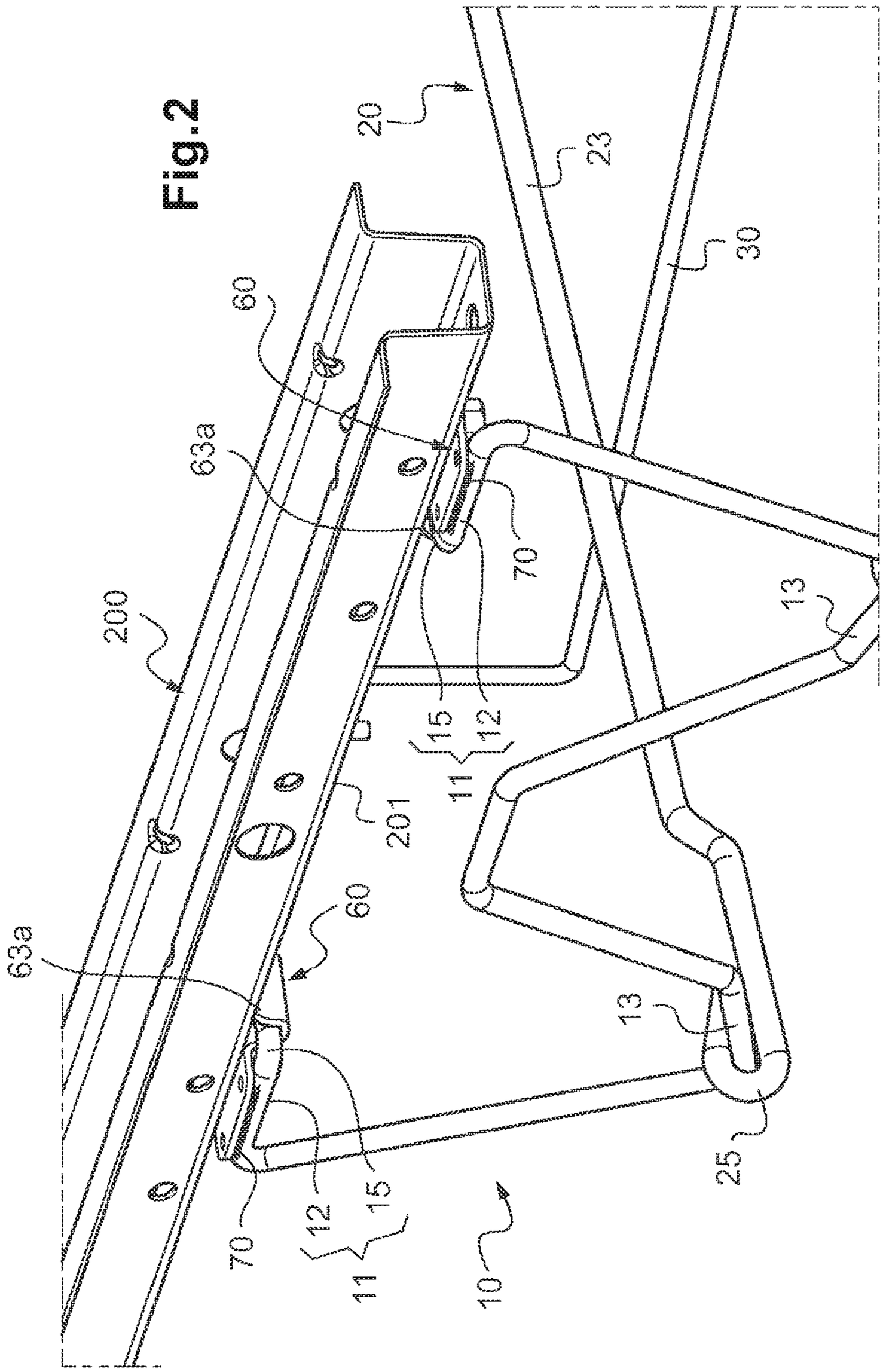
40a
40b
41a
41b
43b
45
47
60
13

Fig.1

Fig.2



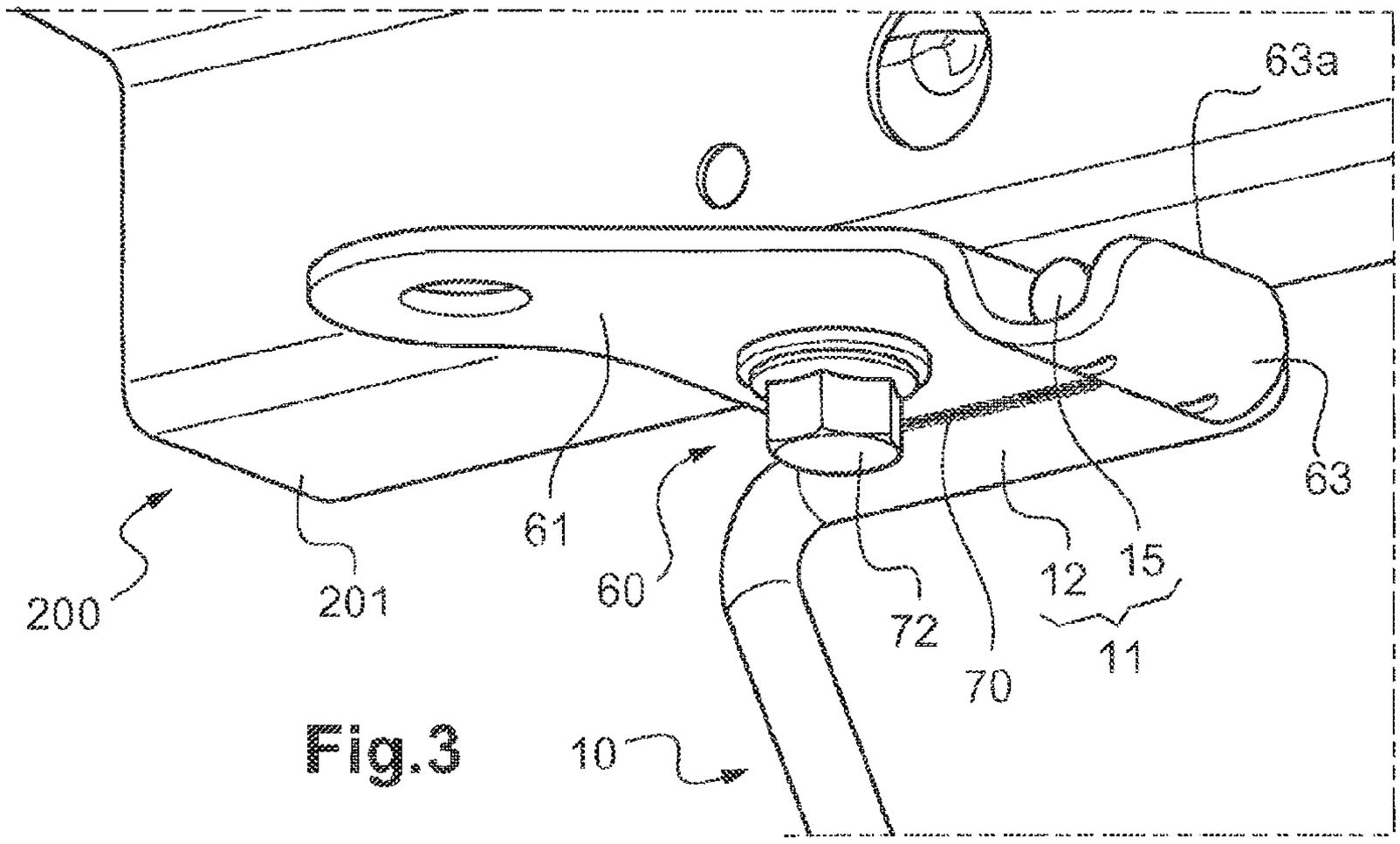


Fig.3

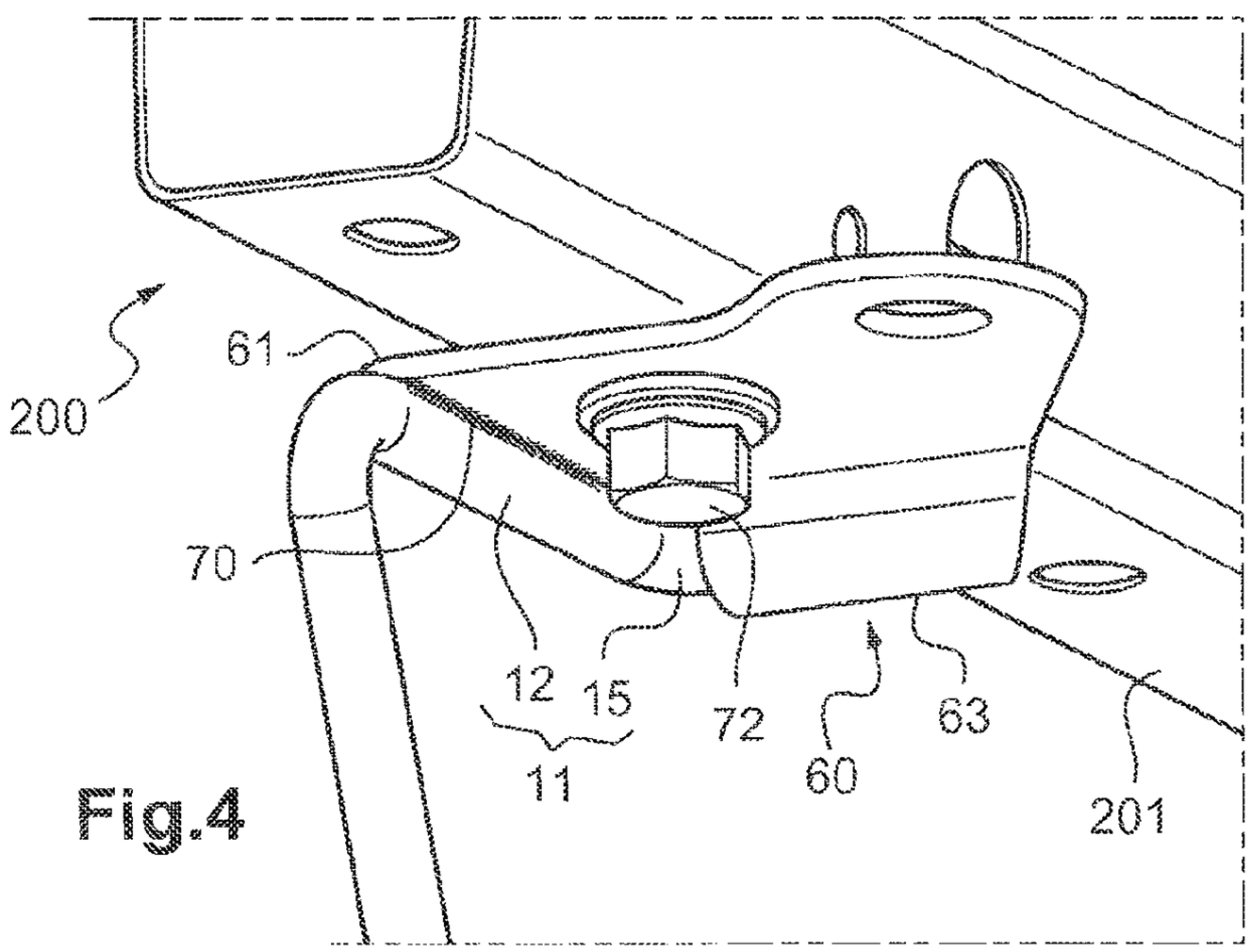


Fig.4

Fig.5

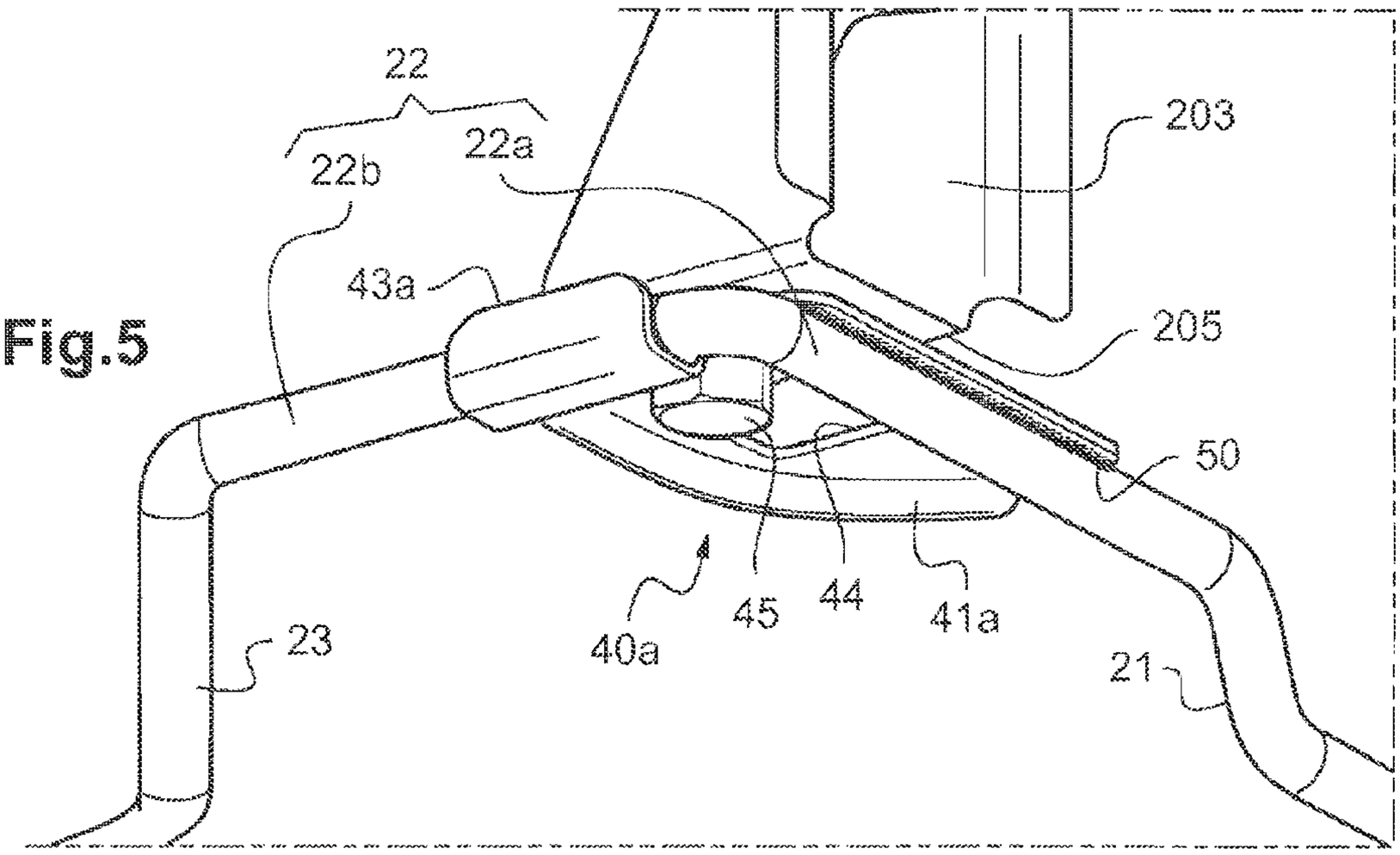
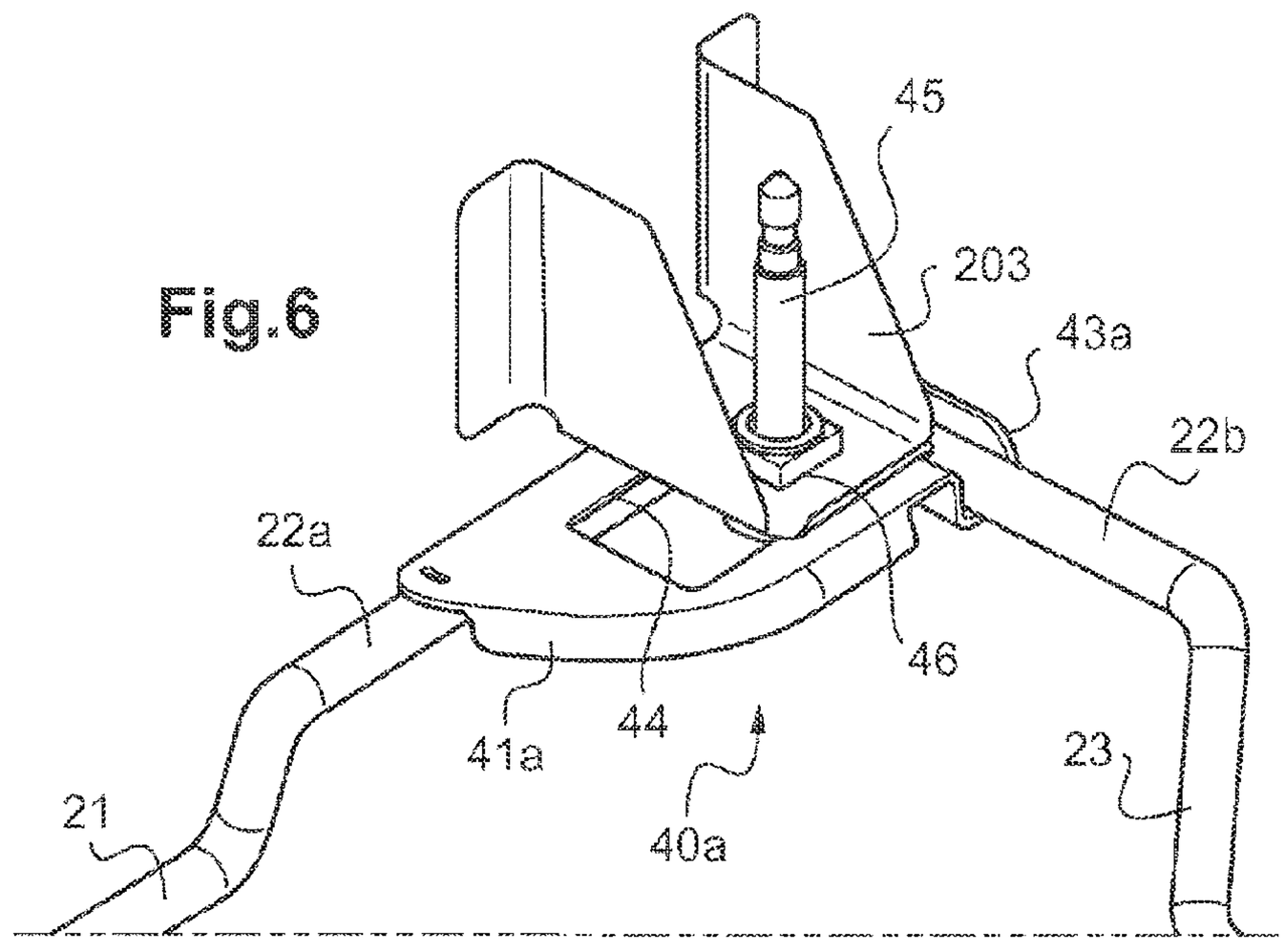

22
22b
22a
203
43a
205
50
23
45
44
41a
40a
21

Fig.6


45
203
43a
22b
22a
46
41a
44
40a
23
21

FASTENER FOR FASTENING A SPARE WHEEL CRADLE TO AN UNDERBODY

BACKGROUND

The invention relates to the field of motor vehicles, and more particularly to that of devices for accommodating a spare wheel below a motor vehicle.

A spare wheel of a vehicle is generally retained below the floor of the vehicle by means of a support, which itself is suspended below the body or chassis of the vehicle. A support of this type can be actuated such as to release the spare wheel when the latter must be used. Supports of this type are described for example in FR 2 922 669 and FR 2 723 715.

Spare wheel supports which are arranged on the underface of motor vehicle bodies are subjected to difficult functioning conditions. The supports are subject for example to strong vibrations, impacts, projections, corrosive conditions, etc. Irrespective of the origin, including during the production or assembly, malfunctioning or breakage of a connection between a support of this type and the remainder of the vehicle constitutes a high risk. When incidents of this type occur below a vehicle which is travelling, the consequences for the safety of the passengers of the vehicle and other road users can be serious.

BRIEF SUMMARY

The objective of the invention is to eliminate the aforementioned disadvantages.

The applicant proposes an assembly for retention of a spare wheel of a motor vehicle, comprising:

- a cradle, comprising a connection area which is secured in a removable manner on the underface of the motor vehicle, said cradle being able to accommodate a spare wheel of a motor vehicle, the cradle being fitted such as to pivot between a closed position, in which the handling of a spare wheel is prevented, and an open position, in which the handling of the spare wheel is permitted;
- a cradle support, comprising a connection area which is secured on the underface of the motor vehicle, and a part which forms a pivot for the cradle.

The assembly additionally comprises at least one unit for retention of the cradle support and/or of the cradle. The retention unit comprises a take-up portion which extends below the connection area of the cradle support or the cradle, in particular when the motor vehicle is in the travelling position.

The retention assembly can have the following characteristics, alone or in combination:

- the unit for retention of the cradle support and/or of the cradle is secured on the underface of the motor vehicle. In particular, the unit for retention of the cradle is secured in a removable manner, for example by being screwed, on the underface of the motor vehicle. This unit for retention of the cradle can in particular form part of a lock which is designed to lock the cradle in the closed position;
- the connection area of the cradle support is secured on the underface of the motor vehicle at least partly by welding. Securing of this type is rapid to implement, and compatible with the assembly chains which exist in the motor vehicle field;
- the connection area of the cradle support is secured on the underface of the motor vehicle at least partly by screwing and/or clamping. Securing of this type can easily be repaired in the event of malfunctioning;
- the take-up portion of the retention unit is in the form of a hook. A hook of this type forms a stable seat for accommodation of the connection area of the cradle support;
- the retention unit comprises a bent metal plate. The production of a unit of this type is rapid and inexpensive. No additional complex part is necessary;
- the retention unit and the cradle support or the cradle are welded to one another. The retention unit and the cradle support or the cradle can be assembled independently from the remainder of the vehicle. Their mutual positioning is pre-established, and the risk of error during the assembly on the vehicle body is reduced;
- the retention unit is made in a single piece. The presence of an assembly point which can give rise to fragility is avoided. The number of production operations is limited;
- the take-up portion of the retention unit is designed to be active only when the securing of the cradle support or the cradle on the underface of the motor vehicle is defective, or when the securing of the connection area on the retention unit is defective. Before any rupture of a first mechanical connection takes place, the take-up portion is spared, and is not subjected to any significant stress. Fatigue of the part is avoided. The service life is increased;
- the take-up portion of the retention unit surrounds at least partially the connection area of the cradle support or of the cradle, such that, in the event of a defect in the securing of said connection area of the cradle support or of the cradle on the underface of the motor vehicle, or in the event of a defect in the securing of said connection area on the cradle support or on the cradle, the take-up portion opposes the fall of the cradle. The cradle is retained better, in particular when the vehicle is travelling.

BRIEF DESCRIPTION OF THE DRAWINGS

Other characteristics, details and advantages of the invention will become apparent from reading the following detailed description and the appended drawings, in which:

FIG. **1** is a view in perspective of an assembly according to the invention, in which the floor of the vehicle and the spare wheel are not represented;

FIG. **2** is a detailed view of the assembly in FIG. **1**, seen from a viewpoint opposite that in FIG. **1**;

FIG. **3** is a detailed view in perspective of part of an assembly according to the invention;

FIG. **4** is a detailed view of FIG. **3** from a viewpoint different from that in FIG. **3**;

FIG. **5** is a detailed view in perspective of part of an assembly according to the invention; and

FIG. **6** is a detailed view of FIG. **5** from viewpoint different from that in FIG. **5**.

DETAILED DESCRIPTION

The following drawings and descriptions contain substantially elements of a certain nature. They can thus be used not only to make the present invention better understood, but also contribute towards its definition, if applicable.

Hereinafter, the terms which define relative positionings such as "top", "bottom", "horizontal", "vertical" and "below" are used in a context in which the wheels of the

motor vehicle are supported in a conventional manner on substantially horizontal ground. In this case, "lower surface" means surfaces which are situated on the underface of the vehicle body, and are generally oriented towards the ground.

Substantially parallel perpendicular or at right-angles means a direction/an angle which is spaced by at the most ±20°, or at the most 10°, or at the most 5°, from a direction which is parallel or perpendicular or from a right-angle.

In FIG. **1**, a cross-member **200** belonging to the vehicle body is represented. In order to facilitate understanding, the remainder of the vehicle body is not represented. The cross-member **200** supports lower surfaces **201** on the underface of the vehicle. The assembly for retention of a spare wheel of the motor vehicle has the reference **100**. The assembly **100** comprises a cradle support **10**, a cradle **20**, two units **40***a*, **40***b* for retention of the cradle **20**, and two units **60** for retention of the cradle support **10** which are similar, and optionally a lateral position limiter **30**. The assembly **100** has a configuration which is substantially symmetrical according to a vertical plane perpendicular to the lateral direction (left-right) of the vehicle.

In the example described here, the cradle support **10** comprises a rigid metal wire. The metal wire is in the general form of a "W" obtained by bending of rigid metal wire. At each of the end portions of the metal wire, the cradle support **10** comprises a connection area **11**. The connection area **11** is broken down into fastener part **12** and a free end part **15**. The fastener parts **12** are secured on a lower surface **201** of the cross-member **200** of the motor vehicle, cf. FIGS. **3** and **4**. The cradle support **10** additionally comprises two parts which form a pivot **13** in the low area of the form in the shape of a "W". The parts which form a pivot **13** are situated in the low part of the cradle support **10** relative to the fastener parts **12** and to the free end parts **15** situated in the high part of the cradle support **10**.

The cradle **20** forms a receptacle for a spare wheel of a motor vehicle. In the example described here, the cradle **20** comprises a rigid metal wire. The cradle **20** is formed by bending rigid metal wire such as to provide the cradle **20** with the general form of a "U".

The cradle **20** comprises a central branch **21**, and two lateral branches **23** which extend substantially perpendicularly to the central part **21**, and generally parallel relative to one another. The two lateral branches **23** are each extended, at their free end opposite the central branch **21**, by a bearing **25**. Each bearing **25** corresponds to one of the two end portions of the rigid metal wire, and is formed by bending end portions in the form of a loop. Each loop is disposed around a corresponding part which forms a pivot **13** of the cradle support **10**. The loops can be fitted, or directly formed by bending, around the pivots **13**. The pivots **13** of the cradle support **10** and the bearings **25** of the cradle **20** cooperate in order to pivot the cradle **20** relative to the cradle support **10**. The cradle **20** pivots around a geometric axis which is substantially parallel to the cross-member **200**. The cradle **20** is suspended on the cradle support **10** by means of the bearing **25**/pivot **13** assemblies.

The cradle **20** can be pivoted between a closed position, in which the handling of a spare wheel is prevented, and an open position, in which the handling of the spare wheel is permitted. In this case, handling of the wheel means the insertion of a spare wheel in the receptacle formed by the cradle **20**, or the extraction of a spare wheel from the receptacle formed by the cradle **20**, depending on the situations. When a spare wheel is accommodated in the cradle **20**, the spare wheel is supported on each of the lateral branches **23** of the cradle **20**. The central branch of the cradle **20** acts as a handle during the pivoting. In the open position, the central branch **21** is in the low position. In the closed position, the central branch **21** is in the high position.

At each of the intersections of its lateral branches **23** and its central branch **21**, the cradle **20** additionally comprises a connection area **22** comprising a fastener part **22***a* and a free part **22***b*. The fastener parts **22***a* are secured in a removable manner on the underface of the motor vehicle.

In the example described here, the lateral position limiter **30** comprises a rigid metal wire in the form of a "U" obtained by bending of the wire. The lateral position limiter **30** comprises two short branches which extend substantially vertically from the underface of the vehicle, and the lower ends of which are extended substantially at right-angles, and are joined by a longer third branch which extends substantially according to the lateral direction of the vehicle. The third branch is disposed perpendicularly below each of the lateral branches **23** of the cradle **20**. The lateral position limiter **30** is formed such as to position the spare wheel laterally, in other words substantially parallel to a transverse direction of the vehicle, and thus prevent any interference between the spare wheel and the underpart of the vehicle body during handling of the cradle **20**. The bent ends of the short branches form a non-aggressive area for the operator in the factory.

The cradle support **10**, the cradle **20** and the lateral position limiter **30** are is case produced by bending a similar metal wire. In variants, different metal wires can be used for the cradle support **10**, the cradle **20** and the lateral position limiter **30**. Production by bending makes it possible to avoid the creation of fragile connections such as welding spots. The different parts can be produced from other materials, for example plastic materials and/or in the form of tubes, formed bars, or even flexible wires. As a variant, the cradle support **10**, the cradle **20** and/or the lateral position limiter **30** can be produced by assembling a plurality of parts. In addition, certain parts can be covered with a covering in order to improve the resistance to corrosion and/or avoid noises of the rattling type derived from the vibrations of the vehicle. Units which facilitate the pivoting, such as rings or roller bearings, can be provided between the bearings **25** and the pivots **13**.

Reference now made to FIGS. **3** and **4**. In this case, the retention unit **60** is produced by bending a metal sheet or plate. As a variant, the retention unit **60** can be made by molding, drawing and/or machining. The retention unit **60** comprises a securing portion **61** and a take-up portion **63** or lug.

The securing portion **61** has a substantially flat form. The securing portion **61** is provided with two through holes, one of which receives a screw **72**. In this case, the securing portion **61** is in contact with a lower surface **201** of the vehicle. The lower surface **201** of the vehicle is in this case supported by the cross-member **200**. The securing portion **61** is retained against the lower surface **201** by the screw **72**. The screw **72** is engaged in the cross-member **200** and in a corresponding nut (not shown in the figures). The nut is supported against the cross-member **200**. As a variant, the nut can be integral with the cross-member **200**, for example it can be welded on it. The securing of the retention unit **60** on the underface of the vehicle by means of a removable fastener, such as a screw-nut pair, makes it possible to dismantle the retention unit **60** and the assembly **100** from the remainder of the vehicle if necessary. As a variant, the retention unit **60** can be secured definitively on the remainder of the vehicle, for example by means of welding or adhesion.

The fastener part **12** of the connection area **11** is oriented substantially parallel to the cross-member **200**. The fastener part **12** of the connection area **11** is oriented substantially according to a lateral direction of the vehicle. The free end part **15** extends the fastener part **12** substantially at right-angles. The free end part **15** extends substantially according to a direction perpendicular to the cross-member **200**. The free end part **15** extends substantially according to a longitudinal direction (from front to rear) of the vehicle. The substantially right-angle between the fastener part **12** and the free end part **15** of the connection area **11** is obtained by bending metal wire when the cradle support **10** is formed.

The fastener part **12** is secured on the underface of the vehicle. In the example described here, this securing is indirect: the fastener part **12** is secured by welding against the retention unit **60**. The retention unit **60** is secured on a lower surface **201** of the cross-member **200**. This indirect securing facilitates the assembly: the securing between the cradle support **10** and the retention unit **60** can be carried out before the installation below the vehicle body, then, in a second stage, the retention unit **60** which is integral with the cradle support **10** can be secured on the body of the vehicle. As a variant, the cradle support **10** is secured directly on the underface of the vehicle, for example directly against the lower surface **201** of the cross-member **200**.

The fastener part **12** is rendered integral with the cross-member **200**, and thus with the vehicle body. In this case, this securing is obtained by welding of the fastener part **12** on a surface which is oriented downwards of the securing portion **61** of the retention unit **60**. A welding bead bears the reference **70** in the figures. This securing constitutes a mechanical connection between the cradle support **20** and the body or chassis of the vehicle.

In variants, the mechanical connection can be obtained by means other than welding, for example adhesion, drawing, riveting, screwing and/or any other means which are appropriate according to the technical constraints.

The take-up portion **63** supplements the mechanical connection between the fastener part **12** and the lower surface **201**, in order to prevent an abnormality in the mechanical connection. In this case, take-up portion **63** means a portion which serves the purpose of taking up, i.e. preventing the fall of, the cradle support **10** in an incident situation in which a fastener of the cradle support **10** on the underface of the vehicle fails. The take-up portion **63** then acts as a mechanical standby for the securing between the fastener part **12** and the lower surface **201**.

In this case, the take-up portion **63** in the form of a hook. The take-up portion **63** forms a projection downwards relative to the plane of the securing portion **61**. The take-up portion **63** has a concave surface which is oriented upwards. The concave surface forms a seat for receipt of the free end part **15** of the cradle support **10**. The form and dimensions of the take-up portion **63** are adapted according to the form and dimensions of the connection area **11**, and in particular the free end part **15** of the cradle support **10** which it accommodates in the installed state. The take-up portion **63** extends below the connection area **11** and in particular below the free end part **15** of the cradle support **10**. In the example described here, the inner space defined by the take-up portion **63** has a generally elongate form perpendicularly to the cross-member **200**, i.e. substantially according to a longitudinal direction of the vehicle. The inner space forms a groove. The groove has a substantially constant cross-section according to the longitudinal direction. The cross-section of the groove is substantially rounded with a diameter which is larger than, or equal to, the diameter of the metal wire which constitutes the free end part **15** of the connection area **11** of the cradle support **10**.

The free end part **15** of the connection area **11** of the cradle support **10**, in the installed state, is accommodated above the take-up portion **63**, in this case in the rounded groove. For as long as the mechanical connection between the fastener part **12** and the lower surface **201** of the vehicle is effective, i.e. the connection between the fastener part **12** and the retention unit **60** in the present example, the take-up portion **63** is inactive. The free end part **15** can be in contact with, or slightly spaced above, the take-up portion **63**. The cradle support **10** is supported by means of the mechanical connection, in this case the welding bead **70** and the fastener part **12**, which is thus subjected to traction. In the case of a defect of this mechanical connection, for example rupture of the welding bead **70**, the fastener part **12** drops and the free end part **15** is taken up by the take-up portion **63**.

Complete falling of the cradle support **10** is prevented. The free end part **15** is then supported on the take-up portion **63**. In other words, the fastener part **12** of the connection area **11** forms a first mechanical connection in normal functioning, and the free end part **15** of the connection area **11** forms a second, standby mechanical connection, in the case of malfunctioning of the first mechanical connection.

A free end **63***a* of the take-up portion **63** is curved upwards. In the example described here, the free end **63***a* is curved upwards substantially as far as the plane of the securing portion **61**. In the state in which it is secured against the lower surface **201** of the cross-member **200**, the free end **63***a* of the take-up portion **63** comes into contact with, or is spaced slightly apart from, the lower surface **201**. In other words, the take-up portion **63** extends below the free end part **15** of the connection area **11** and surrounds it partially. Thus, falling of the free end part **15** from the receptacle formed in the take-up portion **63** by translation and/or sliding in a substantially lateral direction is prevented. The free end **63***a* of the take-up portion **63** acts as an anti-fall rim. As a variant, the take-up portion **63** is arranged below the connection area **11**. The groove surrounds the free end part **15** around 90° to 180° of the cross-section.

Reference is now made to FIGS. **5** and **6**. The retention assembly **100** additionally comprises at least one unit for retention of the cradle **20** arranged on the cradle **20** side opposite the pivots **13**. In order to facilitate access to the spare wheel by a user, the central branch **21** which acts as a handle and the units for retention of the cradle **20** are situated in the vicinity of the rear end of the vehicle.

In the example represented, the assembly **100** comprises a left-hand retention unit **40***a* for the cradle **20** and a right-hand retention unit **40***b* for the cradle **20**. The retention units **40***a*, **40***b* are secured in a removable manner on the underface of the motor vehicle. Two angle irons **203** which are integral with the vehicle body are represented in the figures. The faces which are oriented downwards of the angle irons in this case constitute lower surfaces **205** which belong to the underface of the vehicle.

The retention units **40***a* and **40***b* are similar to the retention unit **60** for the cradle support **10** described with reference to FIGS. **3** and **4**. In this case, each retention unit **40***a*, **40***b* is produced by bending a metal sheet or plate. As a variant, the retention unit **40***a*, **40***b* can be produced by molding, drawing and/or machining.

Each retention unit **40***a*, **40***b* comprises a securing portion **41***a*, **41***b* respectively, and a take-up portion **43***a*, **43***b* respectively, or lug.

Each securing portion **41***b* has a substantially flat form. The securing portion **41***a* of the left-hand retention unit **40***a*

is provided with a through opening **44**. The securing portion **41***b* of the right-hand retention unit **40***b* is also provided with a through hole **47** which receives a screw (not represented in the figures). The securing portions **41***a*, **41***b* are secured on a lower surface **205** of the motor vehicle. The left-hand securing portion **41***a* is secured by means of the screw **45**. The screw **45** passes through the left-hand securing portion **41***a* and engages in a nut **46** which is supported by the angle iron **203**. The right-hand securing portion **41***b* is secured by another screw, not represented, on the lower surface **205** of the angle iron **203**.

The securing between the securing portions **41***a*, **41***b* and the lower surface **25** of the vehicle is removable. By means of complete unscrewing of the screws on the right-hand and left-hand sides, the left-hand **41***a* and right-hand **41***b* securing portions can be separated from the angle irons **203**. The cradle **20** can then be pivoted towards its opening position.

In the embodiment represented in the figures, complete unscrewing of the left-hand screw **45** is superfluous. Loosening the screw **45** is sufficient to permit manual sliding of the securing portion **41***a* relative to the lower surface **205**. Sliding of this type of the securing portion **41***a* (towards the left in FIG. **5**) and resilient deformation of the cradle **20** are sufficient to align the screw **45** and the opening **44** in the securing portion **41***a*. The opening **44** has a size larger than the head of the screw **45**. Thus, the securing portion **41** can be withdrawn downwards, by making the screw head **45** pass through the opening **44**. The screw **45** continues to be engaged in the corresponding nut, integrally with the angle iron **203**. Falling onto the ground and loss of the screw **45** are avoided. In a variant, the screw **45** is designed to make impossible complete unscrewing and removal of the screw **45**. The differences between the openings **46**, **47** in the two securing portions **41***a* and **41***b* form an exception to the symmetrical nature of the assembly **100**.

As previously stated, the connection areas **22** of the cradle **20** are secured in a removable manner on the underface of the motor vehicle. In the example described here, this securing is indirect, which makes it possible to facilitate the assembly, as already stated for the retention unit **60**. The fastener part **22***a* is secured by welding against the left-hand retention unit **40***a*, which itself is secured in a removable manner on a lower surface **205** of the vehicle, as already described. In this case, the fastener part **22***a* is secured on a surface which is oriented downwards of the plate **41***a* of the left-hand retention unit **40***a* by means of a welding bead **50** (FIG. **5**). This securing constitutes a mechanical connection between the cradle **20** and the body or chassis of the vehicle. The securing of the fastener part **22***a* on the securing portion **41***b* of the right-hand retention unit **40***b* is similar. In variants, the mechanical connection can be obtained by other means, for example by gluing, drawing, screwing and/or any other appropriate means.

Each retention unit **40***a*, **40***b* of the cradle **20** has a take-up portion **43***a*, **43***b* respectively, similar to the take-up portion **63** of the connection unit **60**, which acts as a supplement to the mechanical connection between the fastener part **22***a* and the lower surface **205**, in order to prevent an abnormality of the mechanical connection. Thus, the take-up portions **43***a*, **43***b* also serve the purpose of preventing falling of the cradle in a situation in which securing of the cradle on the underface of the vehicle fails.

In the present example, the take-up portions **43***a*, **43***b*, which are identical to the take-up portion **63**, extend below the connection area **22**, and have a concave surface which is oriented upwards and receives the free part **22***b* of the connection area **22** of the cradle **20**. In the example described here, the inner space defined by the take-up portion **43***a*, **43***b* has an elongate form, and also extends substantially according to a longitudinal direction of the vehicle. However, the invention is not limited to this orientation. The dimensions of the groove formed by the inner space are similar to those of the take-up part **63** of the retention unit **60**.

Thus, the free part **22***b* of the connection area **22** of the cradle, the installed state, is accommodated above the take-up portion **43***a*, **43***b*. For as long as the mechanical connection between the fastener part **22***a* and the lower surface **205** is effective, i.e. in this case the connection between the fastener part **22***a* and the retention unit **43***a*, **43***b*, the take-up portion **43***a*, **43***b* is inactive. The free part **22***b* can be in contact with, or slightly spaced above, the take-up portion **43***a*, **43***b*. The cradle **20** is supported by means of the mechanical connection, in this case the welding bead **50** and the fastener part **22***a*, which is subjected to traction. In the event of failure of this mechanical connection, for example rupture of the welding bead **50**, the fastener part **22***a* falls, and the free part **22***b* is taken up by the take-up portion **43***a*, **43***b*, thus preventing complete falling of the cradle **20**.

The take-up portion **43***a*, **43***b* can also have a free end which is formed such as to act as an anti-fall rim, like the take-up portion **63** of the retention unit **60**.

The securing portions **41***a*, **41***b* and the take-up portions **43***a*, **43***b* respectively of the retention units **40***a*, **40***b* described here have similarities of form with the securing portions **61** and the take-up portions **63** of the retention units **60**. This makes it possible to facilitate the production of the parts, for example by using the same basic materials, such as metal plates, from which the parts are cut out and pierced before being bent. The retention units **40***a*, **40***b* and **60** have the common purpose of supporting the weight of the cradle support **10**, the cradle **20** and the spare wheel which is accommodated in it. However, the retention units **40***a*, **40***b* can be operated by a user in order to release the cradle **20**, whereas the retention units **60** serve the purpose of retaining the cradle support **10** in all from circumstances (apart dismantling for maintenance or repair).

In this case, the retention units **40***a*, **40***b* of the cradle **20** thus form a lock which is designed to lock the cradle **20** in the closed position.

Thanks to the mechanical standby provided by the take-up portion **63**, **43***a*, **43***b*, the vehicle can continue to travel, since the cradle **20** is retained, even in the case of failure of the mechanical connection between the fastener part **12** and the lower surface **201** and/or between the fastener part **22***a* and the lower surface **205**. A major risk for safety, an immediate immobilization of the vehicle, and urgent repair, are avoided.

The invention is not limited to the assemblies described above purely by way of example, but incorporates all the variants which persons skilled in the art could envisage within the context of the following claims.

The invention claimed is:

1. An assembly for retention of a spare wheel of a motor vehicle, comprising:

a cradle comprising a connection area secured in a removable manner on an underface of the motor vehicle, said cradle being U-shaped and including two lateral branches and a central branch, each of the lateral branches including a fixed end attached to the central branch and a free end opposite to the fixed end, said cradle being configured to accommodate the spare wheel of the motor vehicle, the cradle being fitted such as to pivot between a closed position, in which handling

of the spare wheel is prevented, and an open position, in which the handling of the spare wheel is permitted;

a cradle support comprising a wire extending between connection areas secured on the underface of the motor vehicle, wherein the free end of each of the lateral branches is attached to the wire of the cradle support such that the cradle support forms a pivot for the cradle; and

at least one unit to retain the cradle support or the cradle, the retention unit comprising a take-up portion that extends below the connection areas of the cradle support or the cradle.

2. The assembly as claimed in claim **1**, wherein the unit to retain the cradle support or the cradle is secured on the underface of the motor vehicle.

3. The assembly as claimed in claim **1**, wherein the connection areas of the cradle support are secured on the underface of the motor vehicle at least partly by welding.

4. The assembly as claimed in claim **1**, wherein the connection areas of the cradle support are secured on the underface of the motor vehicle at least partly by screwing or clamping.

5. The assembly as claimed in claim **1**, wherein the take-up portion of the retention unit is a hook.

6. The assembly as claimed in claim **1**, wherein the retention unit comprises a bent metal plate.

7. The assembly as claimed in claim **1**, wherein the retention unit and the cradle support or the cradle are welded to one another.

8. The assembly as claimed in claim **1**, wherein the retention unit is made in a single piece.

9. The assembly as claimed in claim **1**, wherein the take-up portion of the retention unit is designed to be active only when the securing of the cradle support or the cradle on the underface of the motor vehicle is defective, or when the securing of the connection areas on the retention unit is defective.

10. The assembly as claimed in claim **1**, wherein the take-up portion of the retention unit surrounds at least partially the connection areas of the cradle support or of the cradle, such that, in the event of a defect in the securing of said connection areas of the cradle support or of the cradle on the underface of the motor vehicle, or in the event of a defect in the securing of said connection areas on the cradle support or on the cradle, the take-up portion opposes the fall of the cradle.

11. The assembly as claimed in claim **1**, wherein the free end of each of the lateral branches of the cradle forms a loop around the cradle support.

12. The assembly as claimed in claim **1**, wherein the wire of the cradle support is W-shaped.

13. The assembly as claimed in claim **12**, wherein the connection areas of the cradle support include a first connection area at a first end of the cradle support and a second connection area at a second end of the cradle support.

14. The assembly as claimed in claim **13**, wherein the free end of each of the lateral branches of the cradle is looped around the cradle support at a low area of cradle support.

15. The assembly as claimed in claim **1**, wherein the lateral branches of the cradle are parallel relative to one another.

16. The assembly as claimed in claim **1**, wherein the lateral branches of the cradle are perpendicular relative to the central branch.

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